

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
11 December 2003 (11.12.2003)

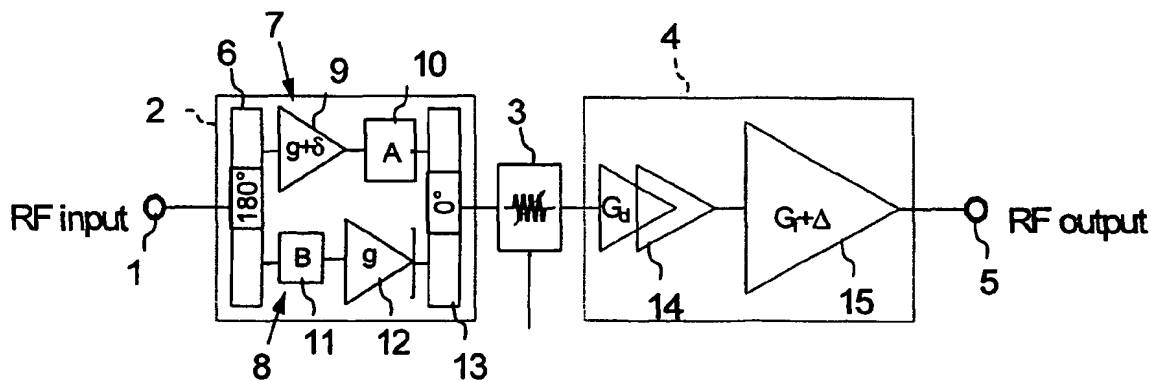
PCT

(10) International Publication Number
WO 03/103136 A1

- (51) International Patent Classification⁷: **H03F 1/32**
- (21) International Application Number: **PCT/EP03/05504**
- (22) International Filing Date: **23 May 2003 (23.05.2003)**
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (30) Priority Data:
02291330.5 **30 May 2002 (30.05.2002)** **EP**
- (71) Applicant (for all designated States except US): **MOTOROLA INC [US/US]; 1303 E.Algonquin Road, Schaumburg, IL 60196 (US).**
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **BOUNY, Jean-Jacques [FR/FR]; Motorola S.A., Avenue Du General Eisenhower, BP1029, F-31023 Toulouse (FR).**
- (54) Title: **POWER AMPLIFIER WITH PRE-DISTORTER**
- (74) Agent: **MCCORMACK, Derek; Motorola European Intellectual, Property Operations, Midpoint, Alencon Link, Basingstoke, Hampshire RG21 7PL (GB).**
- (81) Designated States (national): **AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.**
- (84) Designated States (regional): **ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).**
- Published:
— with international search report

[Continued on next page]

(54) Title: POWER AMPLIFIER WITH PRE-DISTORTER



(57) Abstract: Amplifier apparatus comprising a power amplifier (4) having an operating frequency in the radio frequency ('RF') or microwave or higher ranges and a pre-distorter (2), the characteristics of the power amplifier (4) comprising a distortion from a linear transfer function. The pre-distorter (2) comprises a non-linear path (7), a linear path (8), input means (6) responsive to an amplifier input signal for applying respective pre-distorter input signals to the paths (7,8) and combining means (13) for combining a linear signal from the linear path (8) with a non-linear signal from the non-linear path (7) to produce a pre-distorted signal. The characteristics of the pre-distorter (2) comprise a distortion relative to a linear transfer function such as to tend to compensate for the distortion of the transfer function of the power amplifier. The input means (6) is arranged to apply the pre-distorter input signals to the paths (7,8) substantially in relative phase opposition (+90) and the combining means (13) is arranged to combine the signals from the paths (7,8) without introducing any significant relative phase difference. The input means (6) and the combining means (13) consist substantially of passive components (16 to 21, 30 to 36) and substantially all the components of the pre-distorter (2) are formed in a common semiconductor substrate.